PATENT ABSTRACTS OF JAPAN

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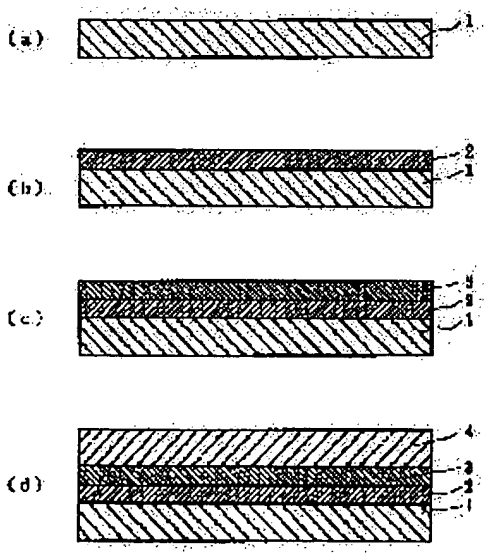
(54) MANUFACTURE OF LAMINATED PACKAGING MATERIAL



(57)Abstract:

PURPOSE: To obtain a packaging material in which oxygen barrier properties and steam barrier properties are not lowered by spraying gas containing ozone to one side surface of a heat sealable thermoplastic resin heat-melted in a curtain state, extruding it, and laminating it by a coating method.

CONSTITUTION: The packaging material is formed by laminating a base material 1 made of polyethylene, polypropylene, etc., a metal oxide layer 2 made of magnesium oxide, silicon oxide, etc., and a heat sealable thermoplastic resin layer 4. The layer 2 is formed on the material 1 by a vacuum vapor-depositing method, an ion plating method. A urethane series, polybutadiene series anchor coating layer 3 is formed on the layer 2. Then, the resin 4 is extruded on the layer 3 by a coating method. In this case, at least one side surface is being coated with the resin melted and extruded in a curtain state by activating the spraying surface with gas such as the air containing ozone.

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MEANS

[Means for Solving the Problem] It is the manufacture method of the laminating wrapping characterized by making this invention in view of an above-mentioned technical problem, extruding invention according to claim 1, spraying the gas which contains ozone at least in one side of this heat-sealing nature thermoplastics by which the thermofusion was carried out to the shape of a curtain in the manufacture method of laminating wrapping that the laminating of a base material, a metallic-oxide layer, and the heat-sealing nature thermoplastics layer was carried out one by one, and carrying out a laminating by the coating method.

[0008] Invention according to claim 2 is the manufacture method of the laminating wrapping characterized by being in any as which a metallic oxide is chosen from a magnesium-oxide layer, an oxidization silicon layer, and an aluminum-oxide layer on the assumption that invention according to claim 1.

[0009] Invention according to claim 3 is the manufacture method of the laminating wrapping characterized by for heat-sealing nature thermoplastics being polyethylene and extrusion temperature being 290 or less degrees a premise [invention according to claim 1 to 2].

[0010] Invention according to claim 4 is the manufacture method of the laminating wrapping characterized by laminating another heat-sealing nature thermoplastics in the case of extrusion coating on the assumption that invention according to claim 1 to 3.

OPERATION

[Function] By spraying the gas which contains ozone for a heat-sealing nature thermoplastics layer in the state of melting according to the manufacture method of the charge of plywood of

this invention, it is possible to activate this resin front face, it can extrude by this, temperature can be lowered about 20 to 30 degrees, and the heating value which the melting resin at the time of extrusion coating which a metallic-oxide layer receives has can be reduced to the grade which does not spoil the oxygen barrier nature and steam barrier nature of a metallic-oxide layer.

[0012] Hereafter, this invention is explained in detail based on a drawing.

[0013] Drawing 1 is explanatory drawing of the manufacturing process of the laminating wrapping of this invention.

[0014] First, a base material 1 (base film) (drawing 1 (a)) is prepared as a base of laminating wrapping. flexible resin films, such as polyethylene by which biaxial extension was carried out as this base material 1, polypropylene, polyester, and nylon, -- a polyethylene-terephthalate film can be used preferably In addition, although especially the thickness of a base material 1 is not limited, it is 12-25 micrometers preferably 6-100 micrometers.

[0015] In order to give gas especially oxygen barrier nature, and steam barrier nature to laminating wrapping, a metallic-oxide layer is formed in this base material 1 by the conventional method (drawing 1 (b)). For example, it can form the large vacuum deposition method of a cost merit preferably by the vacuum deposition method, the ion plating method, the sputtering method, or the plasma CVD method.

[0016] Although the metallic-oxide layer 2 in this invention can use what consists more than of a kind chosen from an oxide and silicon oxides, such as magnesium, aluminum, tin, titanium, zinc, and a zirconium, a nitride, carbide, the fluoride, etc. may be contained by impurities.

[0017] Although it changes with material of construction, the thickness of the metallic-oxide layer 2 is 100-2000A, and when thinking flexible nature as important, it is about 200-800A in thickness.

[0018] Subsequently, an anchor-coat layer is formed by the conventional method on the metallic-oxide layer 2 (plication??: 05.04.1994

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(54) MANUFACTURE OF LAMINATED PACKAGING MATERIAL (57)Abstract:

PURPOSE: To obtain a packaging material in which oxygen barrier properties and steam barrier properties are not lowered by spraying gas containing ozone to one side surface of a heat sealable thermoplastic resin heat-melted in a curtain state, extruding it, and laminating it by a coating method.

CONSTITUTION: The packaging material is formed by laminating a base material 1 made of polyethylene, polypropylene, etc., a metal oxide layer 2 made of magnesium oxide, silicon oxide, etc., and a heat sealable thermoplastic resin layer 4. The layer 2 is for2F%2F%2F%26N0001%3D132%26N0552%3D9%26N0553%3D000004" \t "tjitemdrw" drawing 1 (d)). in this case, continuous [spraying gas such as air which contains ozone at least in one side for this thermoplastics by which melting extrusion was carried out to the

shape of a curtain at low temperature 290 degrees C or less from the T die, and activating a front face] -- the feature is to extrude and coat 13-30 micrometers
[0020] In addition, in order to realize desired heat-sealing nature and desired film intensity, the resin film for insufficient thickness can be prepared in the case of extrusion coating and the heat-sealing nature thermoplastics 4 of desired thickness can be formed by extruding heat-sealing nature thermoplastics between it and the metallic-oxide layer 2 to make thickness of heat-sealing nature thermoplastics 4 thicker than 30 micrometers. Moreover, you may make it desired thickness by performing knockout coating 2 times or more.
[0021] What is used from the former, the same thing, for example, polyethylene, polypropylene, an ethylene vinylacetate copolymer, an ionomer, etc. can be used for such heat-sealing nature thermoplastics.
[0022] making temperature which carries out melting extrusion from a T die into the low temperature of the grade which does not spoil the oxygen barrier nature and steam barrier nature of a metallic-oxide layer -- required -- a resin -- conditions -- things -- in the case of polyethylene, **** is the low temperature of 270 - 290 degrees
[0023] It is 10-40g/Nm3 which made it generate by the well-known method as ozonization conditions for this invention. It sprays on the melting thermoplastics which mentioned already 1-10Nm of flow rates of 3/hr, using gas, such as air, as a carrier for ozone. In fact, it is the value which **(ed) the product of an ozone level and a carrier flow rate by the product of line speed and base-material width Amount g/m2 of ozone It carries out and can manage quantitatively.
[0024] Although especially the carrier gas in this invention does not limit, it can begin general things, such as an argon and nitrogen, and can use the air which can be used cheaply in large quantities.
[0025] Furthermore, since decomposition starts ozone at about 60-70 degrees C, it is desirable to perform the temperature control of carrier gas if needed.
[0026] It is easy to be well-known, for example, can generate easily by the electrodischarge treatment of the air within an airtight container, and the generating method of ozone can convey this quantitatively by carrier gas.
[0027] Especially how to spray the carrier gas of the above-mentioned ozone content can be attained by spraying directly to this ****** from the blowdown fixture of what prepared two or more pinholes in the pipe, and the shape of a pipe which gave the slit, although not limited.
[0028] As mentioned already, while the heat-sealing nature thermoplastics by which melting extrusion was carried out from T die 6 reaches a cooling roller 9, as for the arrangement position of the above-mentioned blasting fixture 5, it is desirable to bring close to this resin as much as possible, and to spray efficiently.

EXAMPLE

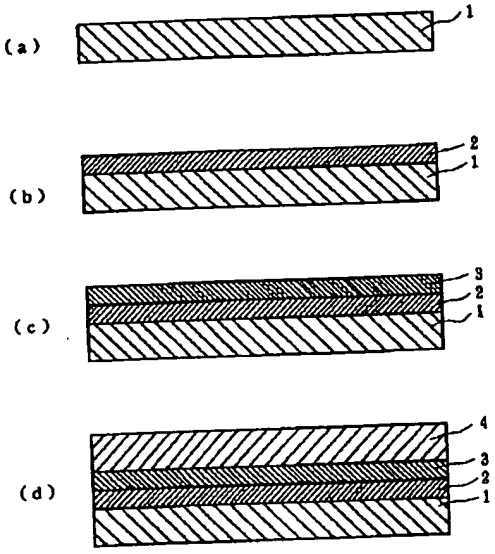
[Example] Hereafter, an example explains this invention concretely.
[0030] [Example 1] The magnesium-oxide layer with a thickness of 600A was formed in polyethylene-terephthalate film 12micrometer of 550mm width by the vacuum deposition method as a base material, and it printed so that an oil based ink (made in [TOYO INK MFG. / CO., LTD. / CO., LTD.] LP supermarket (white)) might be used and ****** might be set to 2-3 micrometers on this magnesium-oxide layer (line speed 90 m/min and line tension 7kg, drying temperature of 60 degrees C).
[0031] 15-micrometer thickness was extruded and coated, having carried out the low density polyethylene (density 0.917MFR 7.2g/10min) at the bottom temperature of a T die of 280

degrees C, and ozonizing on melting extrusion and the following processing conditions on [after carrying out coating of the polybutadiene system anchor-coat agent (EL451, TOYO INK MFG. / CO., LTD. / CO., LTD. make) on this printing layer] this, and laminating wrapping was obtained.
[0032] Processing condition line speed 100 m/min air GIPPU 110mm ozone level 30 g/Nm3 carrier flow rate 3 Nm3 / the amount of hr ozone 2.7*10-2 g/m2. [0033] Under atmospheric pressure, on the conditions of 40 degree-C-90%RH, the moisture vapor transmission (WVTR, g/m2 and day) of the printing poor section of this layered product and the solid color section was used the water-vapor-permeability-test machine (PERMATRAN-W TWIN, MODERN CONTROLS, product made from INC), and was measured. About oxygen permeability (O2 TR, cc/m2 and day), it measured on the conditions of 25 degree-C-100%RH under atmospheric pressure using OXTRAN 10/50A (MODERN CONTROLS, product made from INC). Furthermore, the lamination intensity of the printing solid section and each solid color section was measured, and adhesion was evaluated. These results are shown in Table 1.
[0034] The moisture vapor transmission and oxygen permeability of a layered product of this example showed the low value rather than the case where extruded and it coats with 310 degrees C mentioned later, and also had lamination intensity of enough so that clearly from Table 1.
[0035] [Example 1 of comparison] Except extruding and coating extrusion temperature with 310 degrees C, the charge of plywood was manufactured like the example 1, and a moisture vapor transmission and oxygen permeability were measured further. The result is shown in Table 1. Ming from Table 1 -- as if -- it turns out that the oxygen barrier nature and steam barrier nature of laminating wrapping of this example of comparison are falling greatly
[0036] [Example 2 of comparison] Except extruding and coating extrusion temperature with 270 degrees C, the charge of plywood was manufactured like the example 1, and a moisture vapor transmission and oxygen permeability were measured further. The result is shown in Table 1. Ming from Table 1 -- as if -- although the product made from an oxygen barrier and steam barrier nature of laminating wrapping of this example of comparison show the low value like the example 1, they are understood that lamination intensity is inadequate
[0037] [Example 2] Except extruding and coating extrusion temperature with 290 degrees C, the charge of plywood was manufactured like the example 1, and a moisture vapor transmission and oxygen permeability were measured further. The result is shown in Table 1. Ming from Table 1 -- as if -- each of products made from an oxygen barrier of the laminating wrapping of this example 2 and steam barrier nature showed the good result
[0038] [Example 3] Thickness of polyethylene was set to 30 micrometers on the same conditions as an example 1. The result is shown in Table 1. clear from Table 1 -- as -- oxygen barrier nature and steam barrier nature -- all showed the good result
[0039] [Example 4] The oxidization silicon layer with a thickness of 650A was formed in polyethylene-terephthalate film 12micrometer by the vacuum deposition method like the example 1, and an example 1 and these conditions estimated below. Ming from Table 1 -- as if -- the moisture vapor transmission and oxygen permeability of a layered product of this example showed the low value rather than the case where extruded and it coats with 310 degrees C mentioned later, and lamination intensity also came out of them enough
[0040] [Example 3 of comparison] Extrusion temperature was performed at 310 degrees C in the example 4. As Table 1 shows, it turns out that the oxygen barrier nature and steam barrier nature of laminating wrapping of this example of comparison are falling greatly.
[0041] [Example 5] The 300A aluminum oxide was used for the metallic-oxide layer, and it was similarly estimated as the example 1.
[0042] [Example 4 of comparison] Extrusion temperature was performed at 310 degrees C in the example 5.
[0043]

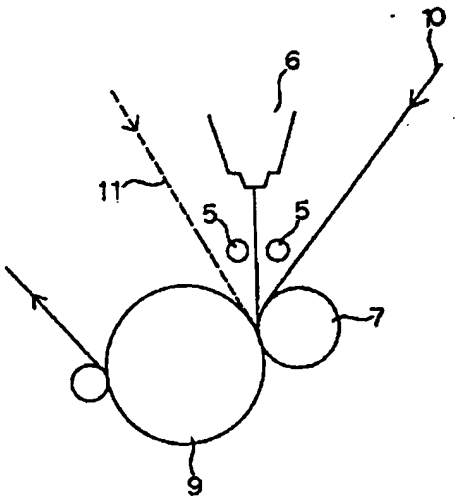
DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is explanatory drawing showing the manufacturing process of laminating wrapping.



[Drawing 2] It is a report Ming view showing an ozonization process.



[Description of Notations]

1 Base Material
2 Metallic-Oxide Layer
3 Anchor-Coat Layer
4 Heat-Sealing Nature Thermoplastics Layer
5 Ozone Blowdown Fixture
6 T Die
7 Back Roll
9 Cooling Roller
10 Laminated Film
11 Laminate Film